

would meet the Commission's broad definition of an SDR, but the manufacturer did not choose to declare them as such at the time of certification. We, therefore, do not know whether these devices incorporate features to prevent unauthorized changes to the operating parameters because there is no requirement to incorporate security features in a transmitter that is not declared as an SDR. Thus, we are concerned about the potential for parties to make unauthorized changes to software programmable radios after they are manufactured and first sold which could result in harmful interference to authorized services. Further, we note that manufacturers are now developing transmitters that are "partitioned" into two or more physical sections connected by wires, where one section houses the control software and another contains the RF transmission functions.¹⁰⁵ We, therefore, believe it is time to revisit the SDR rules to determine if changes are needed concerning whether the SDR rules should be permissive or mandatory, the types of security features that an SDR must incorporate, and the approval process for SDRs that are contained in modular transmitters.

2. Proposals for Part 2 rule changes

85. *Submission of radio software* The rules requires the applicant, grantee, or other party responsible for compliance of an SDR to submit a copy of the software source code that controls the device's radio frequency operating parameters to the Commission upon request.¹⁰⁶ This requirement is analogous to the requirement to supply photographs and circuit diagrams for hardware based devices and was added to assist in enforcement by allowing the Commission's staff to obtain information it could examine to determine if unauthorized changes had been made.

86. Because of the expected complexity and variations in the programming languages of the software used to control radio operating parameters, examining radio software is unlikely to be an effective way to determine whether unauthorized changes have been made to a device. Source code generally can not be directly compared to the software loaded within a device because the source code is compiled before loading and additional changes to the code may be made in the loading process. Even if there were a way to compare software, manufacturers are permitted to make changes to the software that have no effect on the operating parameters at any time without notice to the Commission, and it could prove difficult for the Commission's staff to determine whether such changes affect the compliance of a device. A high level description of the radio software and flow diagram of how it works would be more useful in understanding the operation of a device than a copy of the software. We therefore propose to delete the requirement that grantees or applicants supply a copy of their radio software upon request, and propose to add a less burdensome requirement that applicants supply a description and flow diagram of the software that controls the radio operating parameters. The existing requirement in the rules that certified equipment must comply with the applicable technical rules appears to be a sufficient safeguard against unauthorized changes to equipment.¹⁰⁷ Further, the rules require that an applicant or grantee supply a sample of a device to the Commission upon request that we can test to determine if a device is

¹⁰⁵ For example, a notebook computer may run software that digitally generates a radio frequency waveform and sends the data to a wireless LAN card that further processes and transmits the radio signal.

¹⁰⁶ See 47 C.F.R. § 2.944. Failure to comply within 14 days may be grounds for denial of equipment authorization or monetary forfeitures.

¹⁰⁷ See 47 C.F.R. § 2.931.

**SEPARATE STATEMENT OF
COMMISSIONER JONATHAN S. ADELSTEIN**

Re Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies, ET Docket No. 03-108, Authorization and Use of Software Defined Radios (ET Docket No. 00-47), Notice of Proposed Rulemaking and Order

Earlier this year, I had the privilege of helping the Office of Engineering and Technology open its workshop on cognitive radio technologies. At that time, I remarked that cognitive radios can potentially play a key role in shaping our spectrum use in the future. I believe that these technologies should lead to the advent of smarter unlicensed devices that make greater use of spectrum than is possible today. Cognitive radios may also provide licensees with innovative ways to use their current spectrum more efficiently, and to lease their spectrum more easily on the secondary market. I had the opportunity to see cognitive radios demonstrated during the past year and am just amazed by their potential.

It is for all of these reasons that I am so pleased this item on cognitive radios is before us today. I recently restated my interest in having the Commission make more of an effort to get spectrum in the hands of people who are ready and willing to use it. This is such a timely discussion of the very latest radio technologies and of how we can best harness these developments to improve access to spectrum by those providers who want to serve underserved areas. Spectrum is a finite public resource. And in order to improve our country's use of it, we need to improve access to spectrum-based services, and this effort will facilitate that process.

I am particularly pleased with our proposal to allow higher power operation for unlicensed devices operating in rural and other areas of low spectrum use. We heard last month at our wireless ISP forum that operators across the country need improved access to spectrum. Improving access to spectrum can drive broadband deployment deeper and farther into all parts of America. This item takes such an important step in making that broadband deployment more of a reality.

I believe that cognitive radios will play an important role in "spectrum facilitation." That means stripping away barriers – regulatory, economic, or technical – to get spectrum into the hands of operators serving consumers at the most local levels. Cognitive radios can literally leapfrog the technical and legal problems that currently hamper many of today's spectrum access opportunities. Spectrum policy is a two-sided coin: a framework for innovation on one side, with spectrum facilitation on the other.

I also find the discussion of interruptible spectrum leasing very interesting. Such a development may enable previously reluctant licensees to explore a technological fix to address some of the current challenges of spectrum leasing. While I remain unsure that we should actually allow public safety licensees to potentially lease their spectrum to commercial providers, I appreciate the value in having a discussion on the technical aspects of interruptible spectrum leasing and its possible use by public safety licensees.

90 Equipment used by amateur radio operators is generally exempt from a certification requirement.¹¹¹ We have maintained this policy to encourage innovation and experimentation in the Amateur Radio Service.¹¹² However, we are concerned that it may be possible for parties to modify SDRs marketed as amateur equipment to operate in frequencies bands not allocated to the Amateur Radio Service if appropriate security measures are not employed. However, we do not wish to prevent licensed amateurs from building or modifying equipment, including SDRs that operate only in amateur bands in accordance with the rules. Accordingly, we propose that manufactured SDRs that are designed to operate solely in amateur bands are exempt from the mandatory declaration and certification requirements, provided the equipment incorporates features in hardware to prevent operation outside of amateur bands. We seek comment on this proposal.

91 At present there is a clear distinction between radio transmitter technology, regulated under Section 2.801(a) of our rules and various radio service rules, and personal computer technology, regulated in a much less restrictive way under Subpart B of Part 15 of our rules. However, increasing computer speeds and speeds of digital-to-analog converters (DAC)¹¹³ may well blur this distinction. A general purpose computer capable of outputting digital samples at rates in the million sample/seconds range or higher could be connected to a general purpose high-power, high-speed DAC card which could effectively function as a radio transmitter. The marketing of such computers, DACs, and software to make them interact could undermine our present equipment authorization program at the risk of increasing interference to legitimate spectrum users since none of them would be subject to the normal authorization requirements. At present this is not a problem, but we wish to consider modest steps now to help ensure that this scenario does not become a serious problem.

92. While such high-speed DACs are presently marketed to the scientific community at high unit costs, we are not aware of any which are marketed as consumer items. We seek comment on whether we need to restrict the mass marketing of high-speed DACs that could be diverted for use as radio transmitters and whether we can do so without adversely affecting other uses of such computer peripherals or the marketing of computer peripherals that cannot be misused. We seek comment on one possible approach as well as welcoming alternative proposals. Would it make sense to require that digital-to-analog converters marketed as computer peripherals that 1) operate at more than one million digital input samples/second, 2) have output power levels greater than 100 mW and, 3) have an output connector for the analog output be limited in marketing to commercial, industrial and business users as we require for Class A digital devices? Would it be preferable to characterize such systems in terms of output frequency and bandwidth rather than input sampling rate? What sampling rate and power limits would be needed to avoid impacting DACs that might have a legitimate consumer use such as, for video systems and other media applications? Is there a practical way to incorporate security features that would limit the frequency range or other operating parameters of these devices? We also seek comment on the specific types of devices that would be affected and the potential burden on manufacturers.

¹¹¹ Amateur radio equipment is exempt from a certification requirement, except for external power amplifiers operating below 144 MHz. Such amplifiers must have no gain in the 26-28 MHz band to ensure that they can not be used to amplify the output of transmitters operating in the Citizen's Band (CB) Radio Service. See 47 C.F.R. §§ 97.315 and 97.317.

¹¹² See 47 C.F.R. § 97.1.

¹¹³ The common personal computer sound card uses a low speed DAC, typically about 40,000 samples/second, to produce audio output.

**SEPARATE STATEMENT OF
COMMISSIONER KEVIN J. MARTIN**

Re Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies (ET Docket No. 03-108); Authorization and Use of Software Defined Radios (ET Docket No. 00-47), Notice of Proposed Rulemaking and Order

I am very pleased to support this item, which seeks to facilitate the development of cognitive or “smart” radio technology. Cognitive radio technology has truly great potential to improve spectrum access and efficiency. Among other things, the technology allows for greater sharing of spectrum. As I have previously discussed, promoting spectrum sharing is a fundamental part of encouraging efficient spectrum usage. *See, e.g.,* Remarks by Kevin J. Martin to the FCBA Policy Summit & CLE, *U.S. Spectrum Policy: Convergence or Co-Existence?* (Mar. 5, 2002). While the amount of available spectrum is ultimately limited only by technology, the spectrum supply currently feels very limited. Sharing spectrum is a crucial means to get more mileage out of this important resource. *See id.* Cognitive radio technology allows for greater spectrum sharing by enabling devices to find and use available spectrum in different frequencies, times, or spaces. This can be as simple as frequency hopping in a wireless local area network or as advanced as DARPA’s XG program, which would allow multiple users to share common spectrum by avoiding conflicts in time, frequency, code, and other signal characteristics. I am confident that we will see even greater advances in spectrum sharing through cognitive radio technology, and the Commission should do what it can to facilitate such advances.

Cognitive radio technology also makes possible improved spectrum access in rural areas. Many Wireless Internet Service Providers (WISPs) are using unlicensed spectrum to provide innovative services in rural areas but are finding it difficult to provide adequate signal coverage because of our current Part 15 power limits. This item proposes allowing such providers to increase their power input if they use cognitive radio technology to avoid interference to other users. I am very supportive of this proposal, and I look forward to receiving comments.

Cognitive radio technology also has great potential for enabling interoperability among public safety agencies. Lack of interoperability has been identified as a significant problem in our response to the September 11 attacks and in other disasters involving multiple jurisdictions, and we must all focus on improving interoperability. Cognitive radio technology can play an important part in that improvement by enabling devices to bridge communications between jurisdictions using different frequencies and modulation formats. Through such a mechanism, a fire department from Long Island could communicate effectively with a police department from Manhattan even if they use completely different radio systems. Such interoperability is crucial to enabling public safety agencies to do their jobs.

Accordingly, for all of these reasons, I look forward to receiving comment on how we can best promote cognitive radio technology.

3. Proposals for Part 15 rule changes

95. *Automatic frequency selection for unlicensed devices* Many frequency bands where unlicensed operation is permitted are not harmonized worldwide. For example, in the United States, unlicensed operation is permitted in the 2400-2483.5 MHz band, while in other countries operation is permitted in the 2400-2500 MHz band.¹²¹ The 2483.5-2500 MHz band is used for the Mobile Satellite Service (MSS) in the United States and is a restricted band under Part 15, therefore unlicensed devices are not permitted to transmit in that band to prevent interference to the MSS.¹²² Unlicensed transmitters are now being manufactured in which the frequency range of operation can be software selectable. However, a transmitter can not be approved in the United States unless it is capable of complying with the technical requirements of the rule part under which it will be operated.¹²³ Therefore, an unlicensed transmitter that is capable of operation outside permitted bands of operation under Part 15 of the rules cannot be certified for operation in the United States.

96. Manufacturers would like the ability to certify devices to operate over a wider frequency range than is permitted in the United States, provided the devices incorporate some sort of technology that selects the appropriate operating frequency ranges based on the country in which they are used. A device could limit its operation to authorized frequencies when used in the United States, but could operate on additional frequencies as permitted in other countries. This approach could allow the production of devices that could be used worldwide, or at least in a number of different countries, and eliminate the need for manufacturers to produce multiple versions of a device for use in different countries.

97. Allowing certification of frequency selectable wireless devices could benefit consumers and manufacturers by reducing production costs and allowing production of devices that can be used in both the United States and other countries. We therefore propose to allow certification of Part 15 devices that are capable of operating on non-Part 15 frequencies. We propose to require that such devices incorporate DFS to select the appropriate operating frequency based on the country of operation and must operate on only Part 15 frequencies when used in the United States. In addition, we propose that such devices must incorporate a means to determine the country of operation. There are several methods that a device could use to make this determination. One is to incorporate geo-location capability, such as GPS, combined with a database, to determine the device's geographic location. Alternatively, a device could rely on information provided by another device to determine the country of operation or the permissible frequency band. For example, a device such as a wireless LAN card could rely on a network access point to select the appropriate operating frequency band. Under that scenario, it would be necessary to assure that the network access point is capable of determining its location and communicating that information to a connected device.

98. We seek comment on this proposal, in particular, the means that a device should employ to determine its country of operation and select the appropriate operating frequency range. Are there methods other than the ones described above that could be employed? How should a device respond if it is unable to determine its geographic location? If the frequency band or country of operation is determined by an external device such as a network access point, what specific requirements should

¹²¹ See 47 C.F.R. §§ 15.247 and 15.249.

¹²² See 47 C.F.R. §§ 15.205 and 25.202.

¹²³ See 47 C.F.R. § 2.915(a)(1).

**SEPARATE STATEMENT OF
COMMISSIONER MICHAEL J. COPPS**

Re Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies (ET Docket No. 03-108), Authorization and Use of Software Defined Radios (ET Docket No. 00-47), Notice of Proposed Rule Making and Order

Cognitive radios have the potential to be a powerful tool for increasing spectral efficiency while keeping interference at acceptably low levels. So, I hope that this NPRM keeps us moving in the direction of allowing consumers and companies to take advantage of these new technologies. I am also eager to explore the idea of allowing higher power levels for unlicensed technologies in rural areas. The wireless networking community has been asking for this for a long time now. If higher powers allow them to bring more service to under-served areas, and more competition to areas largely bereft of competition, we are already late to the game. So I'm glad we're moving forward.

Finally, I want to note that while this NPRM examines technologies that would allow public safety entities such as police departments and fire companies to lease spectrum to non-public-safety users, I will need to be convinced that this is a good idea before voting to allow it. While I want to increase the efficiency of spectrum use in crowded bands, I will need to see proof that allowing commercial operation in the same bands relied on by policemen and firemen is safe. And I will need to be convinced that the lure of big dollar figures from commercial companies will not lead to states and municipalities living in difficult budget environments to lease out not only extra spectrum, but also core spectrum.

- Determine time period to monitor before declaring that the spectrum is not occupied.
- Ensure transmitter power control adjusts to the correct level.
- Time to revisit a portion of the spectrum to ensure that it is still unused.
- Response time to vacate a portion of the spectrum when it is determined that the spectrum is being used

102 We seek comment on the above tests as well as on any other tests that may be needed to assure compliance by unlicensed devices with the SDR and any new cognitive radio rules, as well as a more detailed description of the measurement procedures that could be used. For testing a device's response to various standardized input signals, we seek comment on the frequencies, types and levels of the signals that should be used. Should there be a series of input signal tests required, and if so, what should they be? We also seek comment on whether the Commission should develop such test procedures or whether they should be developed through an industry standards organization such as ANSI

103. *Tests required for interruptible radios.* We discussed above that cognitive radios could conceivably share spectrum with other services, such as public safety or commercial users. Such sharing could be facilitated by use of a reversion mechanism, as proposed for public safety frequencies, that causes the cognitive radio to cease transmission when the primary user of the spectrum needs to use it. The reversion mechanism could be the loss of a beacon signal or there could be some other control signal telling the cognitive radio to cease transmission. In order to assure that the reversion mechanism works properly, certain new tests may be needed for radios using one of these technologies. We seek comment on the testing criteria may be appropriate for an RF beacon based system. Likewise, we seek comment on what testing criteria may be appropriate for beacon systems whose signal is not delivered over the air. We seek comment on whether these tests are appropriate, and whether additional tests should be required

- Ability of the radio to sense a beacon or other control signal on the appropriate frequency or from another source.
- Minimum receive sensitivity for the control signal
- Response time to vacate channel when beacon signal is lost or other control signal orders cessation of transmission.

104 *Other required tests specific to cognitive radios* In addition to the specific cases described above, there may be a need to establish a more general framework for testing cognitive radios. We seek comment on the need for the following tests for different types of cognitive radio technology.

105 Listen-before-talk systems scan one or more frequency ranges to determine whether there are any other users present before transmission. The following tests may be appropriate for listen-before-talk systems.

- Determining the frequency band that is scanned by device
- Measuring the scanning resolution bandwidth
- Sensitivity of the scanning receiver used to determine spectrum occupancy
- Ability of the device to select an operating frequency and power level based the presence of various standardized test input signals.
- Determine time period to monitor before declaring that the spectrum is not occupied.
- Time to revisit a portion of the spectrum to ensure that it is still unused.
- Response time to vacate a portion of the spectrum when it is determined that the spectrum is being used

**SEPARATE STATEMENT OF
CHAIRMAN MICHAEL K. POWELL**

Re Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies (ET Docket No. 03-108), Authorization and Use of Software Defined Radios (ET Docket No. 00-47), Notice of Proposed Rulemaking and Order

Today we take another step forward to improve access and efficiency of our Nation's spectrum and to provide opportunities beyond today's horizon. I am pleased to support this item that grew out of the Spectrum Policy Task Force and that explores the many benefits of smart radio technology and its real-time processing capabilities. Last week, I had the pleasure of visiting several high-tech companies and met with tribal communities that are taking advantage of these new and innovative technologies.

Recent advances in smart radio technologies have the potential to provide more innovative, flexible, and comprehensive use of spectrum while at the same time minimizing the risk of harmful interference. On a real-time basis, smart radios determine their location or environment, have the flexibility to select the best frequencies to use, know how to avoid interference with existing users, and can use vacant spectrum channels. Not only do they have flexibility to use a variety of frequencies, they also can understand and transmit in many different formats.

Smart radio technologies also offer potential solutions to the increasingly crucial interoperability demands facing public safety entities and other licensed users to enable them to coordinate response and recovery efforts and ensure national security. Because they can use different frequencies and modulation techniques, smart radios could also translate signals between two different radio systems. This ability may enable more interoperability between public safety first responders – so that, in an emergency, firefighters from one jurisdiction could more effectively communicate with firefighters in another jurisdiction.

Today's Notice of Proposed Rulemaking and Order is part of a larger effort to expand opportunities for wireless services in rural America. We recently adopted two Notices of Proposed Rulemakings designed to foster advanced telecommunications in rural America. First, an NPRM on how we can clarify rules to minimize regulatory costs and provide incentives to serve rural markets. And second, an NPRM on modified power limits, new technologies such as smart antennas, and streamlined equipment approval.

In this proceeding, we will consider the technical capabilities as well as proposed changes to the Commission's rules and equipment authorization processes to accommodate and enable more efficient use of software defined radio and cognitive radio system technologies. Of special note is the potential of smart radios to facilitate spectrum leasing transactions, including possible leasing of public safety spectrum that would not otherwise be possible without the technology.

The possible uses for smart radios are wide ranging. The challenge before the Commission is to determine how we can open the door for these technologies so as not to shut out any of their tremendous potential.

contained in this Notice, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. Public and agency comments are due at the same time as other comments on this Notice, OMB comments are due 60 days from date of publication of this Notice in the Federal Register. Comments should address (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility, (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

110 *Ex Parte Presentations* This is a permit-but-disclose notice and comment rule making proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. See generally 47 C.F.R. §§ 1.1202, 1.1203, and 1.2306(a).

111 *Filing Comments* Pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on or before [75 days from publication in Federal Register], and reply comments on or before [105 days from publication in Federal Register]. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. See Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24121 (1998).

112. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/cgb/ecfs/>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form ". A sample form and directions will be sent in reply. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appear in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number.

113. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail).

114. The Commission's contractor, Natek, Inc., will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002.

-The filing hours at this location are 8:00 a.m. to 7:00 p.m.

-All hand deliveries must be held together with rubber bands or fasteners.

-Any envelopes must be disposed of before entering the building.

-Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

and wireless communications equipment, and possibly there are more that operate with more than 500 but fewer than 750 employees

WISPs and other Wireless Telecommunication Service Providers

The SBA has developed a small business size standard for Cellular and Other Wireless Telecommunication, which consists of all such firms having 1,500 or fewer employees.¹³⁶ According to Census Bureau data for 1997, in this category there was a total of 977 firms that operated for the entire year.¹³⁷ Of this total, 965 firms had employment of 1,000 employees or more.¹³⁸ Thus, under this size standard, the majority of firms can be considered small.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

Both licensed and unlicensed transmitters are already required to be authorized under the Commission's certification procedure as a prerequisite to marketing and importation, and the proposals in this proceeding would not change that requirement. There would, however, be several changes to the compliance requirements

Software defined radios in which the software can be easily changed after manufacture would have to be declared as software defined radios at the time the application for certification is filed. This would be a change from the current process, in which declaring a device as a software defined radio is optional. A software defined radio must incorporate security features to prevent unauthorized software changes that affect the operating parameters, and the applicant must describe them in the certification application. We do not expect that this would be a significant compliance burden because manufacturers of radios that would be affected by this requirement generally already take steps to ensure the security of the radio software

Unlicensed transmitters that would be permitted to operate at higher power in rural and other areas with limited spectrum would have to incorporate sensing capabilities to ensure that higher power operations could occur only in areas where it is permitted. The applicant for certification would have to demonstrate in the application that the equipment meets the requirements

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): "(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small

¹³⁶ 13 C.F.R. § 121.201. NAICS code 517212 (changed from 513322 in October 2002).

¹³⁷ U.S. Census Bureau, 1997 Economic Census, Subject Series Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 5, NAICS code 513322 (issued October 2000)

¹³⁸ *Id.* The census data do not provide a more precise estimate of the number of firms that have 1,500 or fewer employees, the largest category provided is "Firms with 1,000 employees or more."

APPENDIX A: PROPOSED RULE CHANGES

Part 2 of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

- 1 The authority citation for Part 2 continues to read as follows.

AUTHORITY 47 U.S.C. 154, 302a, 303 and 336, unless otherwise noted.

- 2 Section 2.944 is proposed to be revised to read as follows.

§ 2.944 Submission of radio software description.

Applications for certification of software defined radios must include a description and flow diagram of the software that controls the radio frequency operating parameters.

3. Section 2.1033 is proposed to be revised by adding new paragraphs (b)(12) and (c)(18)

§ 2.1033 Application for certification

* * * * *

(b) * * *

(12) Applications for certification of software defined radios must include the information required by §§ 2.932(e) and 2.944

(13) Applications for certification of radios operated pursuant to § 90.xxx must demonstrate compliance with the requirements in § 90.yyy.

(c) * * *

(18) Applications for certification of software defined radios must include the information required by §§ 2.932(e) and 2.944

Part 15 of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

- 4 The authority citation of Part 15 continues to read as follows

AUTHORITY 47 U.S.C. 154, 302, 303, 304, 307, 336, and 544A.

- 5 A new Section 15.202 is proposed to be added to read as follows:

§ 15.202 Certified operating frequency range

Certification may be obtained for a device that is capable of operating on frequencies not permitted by this part, provided the device incorporates DFS and operates on only United States frequencies when operated in the United States.

- 6 A new Section 15.206 is proposed to be added to read as follows:

§ 15.206 Cognitive radio devices

APPENDIX B. INITIAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹²⁸ the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this Notice of Proposed Rule Making (Notice). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the Notice provided in paragraph 111 of the item. The Commission will send a copy of the Notice, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).¹²⁹ In addition, the Notice and IRFA (or summaries thereof) will be published in the Federal Register.¹³⁰

A. Need for, and Objectives of, the Proposed Rules

In the Notice of Proposed Rule Making section, we propose several changes to Parts 2, 15 and other Parts of the rules. Specifically, we propose to

- 1) eliminate the requirement for applicants and grantees of equipment authorization to supply a copy of the software that controls the operating parameters of a software defined radio, but add a new requirement that applicants for equipment authorization supply a description and flow diagram showing how the radio software operates
- 2) require that certain radios that meet the definition of a software defined radio must be declared as such at the time of filing the certification application, and that they must incorporate a means to prevent unauthorized software changes that could change the operating parameters of the radio.
- 3) permit certification of wireless LAN cards that incorporate additional frequency bands for use in other countries, but limit their operation to authorized frequencies in the United States,
- 4) permit certain unlicensed devices to operate at higher power levels in areas with limited spectrum use;
- 5) allow equipment to be developed that could allow public safety entities to lease spectrum on a temporary basis but reclaim it immediately when necessary.

These proposals, if adopted, will prove beneficial to manufacturers and users of unlicensed technology, including those who provide services to rural communities. Specifically, we note that a growing number of wireless internet service providers (WISPs) are using unlicensed devices within wireless networks to serve the needs of consumers. WISPs around the country are providing an alternative high-speed connection in areas where cable or DSL services have been slow to arrive. The higher power limits proposed herein will help to foster a viable last mile solution for delivering Internet services, other data applications, or even video and voice services to underserved, rural, or isolated communities.

¹²⁸ See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 - 612 has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

¹²⁹ See 5 U.S.C. § 603(a).

¹³⁰ See 5 U.S.C. § 603(a).

(2) Devices operating under § xx xxx of this part must detect the Public Safety Licensee's beacon signal or cease operations within two seconds. Devices must also incorporate a means to select the transmission frequency specified in the Public Safety Licensee's beacon signal.